

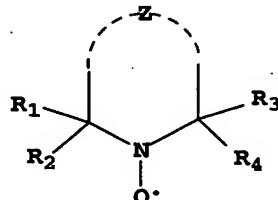
CLAIMS:

1. A silver-free black-and-white thermographic material comprising a support having thereon at least one imaging layer comprising predominantly a hydrophilic or water-dispersible polymeric latex binder, and 5 further comprising:

- a) a color developing agent precursor that releases a color developing agent when heated to a temperature of at least 80°C, and
- b) a cyan dye-forming color coupler that is capable of reacting with said released color developing agent to produce a cyan dye,
- 10 c) a magenta dye-forming color coupler that is capable of reacting with said released color developing agent to produce a magenta dye,
- d) a yellow dye-forming color coupler that is capable of reacting with said released color developing agent to produce a yellow dye, and
- e) an oxidizing agent that is a hindered-amine N-oxyl that is 15 capable of oxidizing the released color developing agent,

 said material being substantially free of silver metal or reducible silver ions.

2. The material of claim 1 wherein said oxidizing agent is 20 represented by the following Structure I:



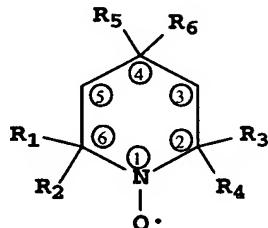
wherein R₁, R₂, R₃, and R₄ are independently substituted or unsubstituted alkyl groups, substituted or unsubstituted aryl groups, or substituted or unsubstituted cycloalkyl groups, or R₁ and R₂ or R₃ and R₄ are combined to form a substituted or unsubstituted carbocyclic or heterocyclic ring, and Z represents the carbon or 25 nitrogen atoms necessary to complete a 5- to 14-membered heterocyclic ring.

3. The material of claim 2 wherein R₁, R₂, R₃, and R₄ are independently substituted or unsubstituted alkyl groups having 1 to 4 carbon atoms, substituted or unsubstituted cyclohexyl groups, or substituted or unsubstituted phenyl groups, and Z represents the carbon or nitrogen atoms necessary to complete a 5- or 6-membered heterocyclic ring.

4. The material of claim 2 wherein R₁, R₂, R₃, and R₄ are independently unsubstituted methyl, ethyl, cyclohexyl, or phenyl groups.

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5. The material of claim 1 wherein said oxidizing agent is represented by the following Structure II:



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(II)

wherein R₁, R₂, R₃, and R₄ are independently substituted or unsubstituted alkyl groups, substituted or unsubstituted aryl groups, or substituted or unsubstituted cycloalkyl groups, or R₁ and R₂ or R₃ and R₄ are combined to form a substituted or unsubstituted carbocyclic or heterocyclic ring, R₅ and R₆ are independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, substituted or unsubstituted cycloalkyl groups, hydroxy, alkyl esters, aryl esters, or sulfonyl esters, or R₅ and R₆ are combined to form an oxo group or a substituted or unsubstituted carbocyclic or heterocyclic ring.

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6. The material of claim 5 wherein at least one of R₅ and R₆ is hydrogen.

7. The material of claim 6 wherein at least one of R_5 and R_6 is hydrogen and the other is hydroxy, an alkyl group, or an alkyl or aryl ester.

8. The material of claim 5 wherein R_5 and R_6 are combined to
5 form an oxo group.

9. The material of claim 1 wherein said oxidizing agent is
2,2,6,6-tetramethylpiperidinyloxy, free radical, 4-hydroxy-2,2,6,6-
tetramethylpiperidinyloxy, free radical, 4-hydroxy-2,2,6,6-
10 tetramethylpiperidinyloxy benzoate, free radical, or 2,2,6,6-tetramethyl-4-
(methylsulfonyloxy)-1-piperidinoxy, free radical .

10. The thermographic material of claim 1 wherein said
oxidizing agent is present in an amount of from about 0.5 to about 20 mol/mol of
15 color developing agent precursor.

11. The material of claim 1 wherein said color developing
agent precursor releases a *p*-phenylenediamine color developing agent upon
heating to a temperature of at least 80°C.

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12. The material of claim 1 wherein said color developing
agent precursor is present in an amount of from about 0.0001 to about 0.1 mol/m².

13. The material of claim 1 wherein said cyan dye-forming
25 color coupler, said magenta dye-forming color coupler, and said yellow dye-
forming color coupler are independently present in an amount of from about 0.01
to about 1 mol/mol of color developing agent precursor.

14. The material of claim 1 wherein said binder is a hydrophilic
30 binder is gelatin, a gelatin derivative, a cellulosic material, or a poly(vinyl
alcohol).

15. The material of claim 1 that is duplitized, having one or more of the same or different imaging layers on both sides of said support.

16. The material of claim 1 further comprising a protective 5 layer over said one or more imaging layers.

17. A silver-free, black-and-white, non-photosensitive thermographic material that comprises a transparent polymer support having on only one side thereof one or more thermally sensitive imaging layers and an outermost non-10 thermally sensitive protective layer over said one or more thermally sensitive imaging layers,

said one or more thermally sensitive imaging layers comprising predominantly one or more hydrophilic binders, and in reactive association, imaging chemistry consisting essentially of:

- 15 a) a color developing agent precursor that releases a *p*-phenylenediamine color developing agent when heated to a temperature of at least 80°C, said color developing agent precursor being present in an amount of from about 0.001 to about 0.05 mol/m²,
- 20 b) a cyan dye-forming color coupler that is capable of reacting with said released color developing agent to produce a cyan dye,
- c) a magenta dye-forming color coupler that is capable of reacting with said released color developing agent to produce a magenta dye,
- d) a yellow dye-forming color coupler that is capable of reacting with said released color developing agent to produce a yellow dye,
- 25 e) an oxidizing agent that is 2,2,6,6-tetramethylpiperidinyloxy, free radical, 4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy, free radical, or 4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy benzoate, free radical, and is present in an amount of from about 1 to about 10 mol/mol of said color developing agent precursor, and
- 30 f) a development enhancing toning agent,

said material being substantially free of silver metal or reducible silver ions, and said cyan dye-forming color coupler, magenta dye-forming color

coupler, and yellow dye-forming color coupler being independently present in an amount from about 0.05 to about 0.5 mol/mol of said color developing agent precursor.

5 18. The material of claim 12 wherein said hydrophilic binder is gelatin or a derivative thereof, a cellulosic material, or a poly(vinyl alcohol).

10 19. A method comprising imaging the thermographic material of claim 1 with a thermal imaging source to provide a visible image.

15 20. The method of claim 19 wherein said thermographic material comprises a transparent support and said image-forming method further comprises:

15 positioning said imaged thermographic material with the visible image thereon between a source of imaging radiation and an imageable material that is sensitive to said imaging radiation, and

15 thereafter exposing said imageable material to said imaging radiation through the visible image in said imaged thermographic material to provide an image in said imageable material.

20 21. A method comprising imaging the thermographic material of claim 17 with a thermal imaging source to provide a visible image.

25 22. The method of claim 21 wherein said imaging is carried out using a thermal print head or a laser.

25 23. The method of claim 19 further comprising using said imaged thermographic material for medical diagnostic purposes.